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| APPLICATION NO.      | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|----------------------|-------------|----------------------|---------------------|------------------|
| 10/629,444           | 07/29/2003  | Paul S. Danielson    | SP03-091            | 5737             |
| 22928                | 7590        | 01/26/2005           | EXAMINER            |                  |
| CORNING INCORPORATED |             |                      | YU, MELANIE J       |                  |
| SP-TI-3-1            |             |                      | ART UNIT            |                  |
| CORNING, NY 14831    |             |                      | PAPER NUMBER        |                  |
|                      |             |                      | 1641                |                  |

DATE MAILED: 01/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/629,444

Applicant(s)

DANIELSON ET AL.

Examiner

Melanie Yu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 July 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>7/29/12/17</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Objections***

1. Claims 4 and 13 are objected to because of the following informalities: the term RFU must be written out. Appropriate correction is required.

### ***Drawings***

2. The drawings are objected to because Figure 4 fails to show false-color images as described in the specification. Furthermore, it appears that the Figure 4 is showing color differences, which cannot be seen in black and white. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1 and 18 recite a porous region being primarily of inorganic material, which is vague and indefinite because the amount of inorganic material required for the porous region to be inorganic is unclear. Furthermore, it is unclear how many probes are encompassed by the recited "a number of probes". It is vague as to whether immobilized are claimed as part of the invention or whether the porous region must merely have the capability of immobilizing probes.

Claim 4 recites "at least an order of magnitude", which is rendered vague because the amount of additional auto-fluorescence exhibited by the porous region over the non-porous region is unclear.

Regarding claims 8-10, 21, and 22, it is unclear whether the colorant component is included in the composition in addition to the oxides present, or if the weight percentage consisting of the components recited inherently includes the colorant component. Furthermore, it is unclear whether at least one of the following recited components:  $\text{Co}_3\text{O}_4$ ,  $\text{NiO}$ , and  $\text{R}_x\text{O}_y$  are required for the composition because  $x$  and  $y$  can be zero and the weight percentage of  $\text{R}_x\text{O}_y$  can also be zero.

Regarding claims 11 and 12, it is unclear what is meant by a chemically and mechanically durable glass composition.

Claim 13 is vague and indefinite because it is unclear whether a GAPS-coating process provides further product limitations to the porous substrate of claim 1. Therefore, any product

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having the product limitations recited in claims 1 and 13 would be capable of having the recited features before a GAPS-coating process.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-9 and 13-23 are rejected under 35 U.S.C. 102(e) as being anticipated by Pantano et al. (US 2003/0054176).

Pantano et al. teach a porous substrate comprising: a nonporous support [0002]; and a porous region on a surface of the support [0025, 0026], the porous region being of primarily inorganic material [0053] and having a surface upon which a number of probe molecules can be immobilized [0007], the porous region having a tint and exhibiting a reduced level of auto-fluorescence of at least about 50% relative to a comparable non-tinted porous substrate surface [0008], which encompasses the recited reduced auto-fluorescence values of at least about 15%, at least about 20-25%, and at least about 50%. The reduced relative auto-fluorescence level in RFU (less than 70 self fluorescent units) is at least an order of magnitude over the non-tinted porous substrate surface (relative self fluorescent units are relative fluorescent units; [0021]), and the reduction is over a wavelength range from about 470 and 700 nm (fluorescent dyes are FluorX, Cy3 and Cy5 which have an emission window between 470 nm and 700 nm, and is the same window over which the auto-fluorescence is reduced; Fig. 2 – excitation and emission data

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for fluorescent dyes; Fig. 3 – auto-fluorescence reduction over range; [0041, 0049]), which encompasses the recited ranges of 400 to about 720 or about 420 nm to about 700 nm.

With respect to claims 7 and 20, Pantano et al. teach the tinted porous region having a colorant component including a transition metal ion (Zinc; [0051]).

Regarding claims 8, 9, 21, and 22, Pantano et al. teach a tinted porous region consisting essentially of the weight percentages of the following components: SiO<sub>2</sub>: 65-75 %, Al<sub>2</sub>O<sub>3</sub>: 0-3%, B<sub>2</sub>O<sub>3</sub>: 0-5%, K<sub>2</sub>O: 5-15%, MgO: 0-6%, CaO: 0-10%, SrO: 0%, BaO: 0.1-5%, Sb<sub>2</sub>O<sub>3</sub>: 0-2%, and Fe<sub>2</sub>O<sub>3</sub> – 0% [0053], all of which weight percentages fall within the recite ranges of claims 10 and 21.

With respect to claim 13, Pantano et al. teach a tinted region having an average auto-fluorescence background for Cy3 and Cy5 channels [0041] of up to about 50% RFU of said untinted porous substrate [0008]. Claim 13 recites a GAPS-coating process, which fails to provide further product limitations on the product of claim 1, and is therefore not considered part of the product of claim 13.

Regarding claims 14-17 and 23, Pantano et al. teach a number of biological DNA probes attached at defined locations on or within the porous layer [0062], wherein the defined locations assume a microarray format of 10,000 probe droplets/cm<sup>2</sup> [0035], which encompasses the recited ranges of microspots of at least 1 and at least 10 microspots per cm<sup>2</sup>.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pantano et al. (US 2003/0054176) in view of Tanner et al. (US 2003/0003474).

Pantano et al., as applied to claims 1 and 10, teach a porous region comprising a composition consisting essentially of the components listed above, but fail to teach SrO being present in the composition.

Tanner et al. teach a glass composition comprising 0.58 wt % SrO (Table 1, [0057]), which is encompassed by the recited range of 0.5-1.75 wt %, in order to create a porous layer made from borosilicate frit to reduce background fluorescence.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to include in the composition for the porous layer on the substrate of Pantano et al., 0.58 wt % SrO as taught by Tanner et al., in order to provide a porous, inorganic substrate surface to enhance the retention of nucleic moieties and provide increased surface area for immobilizing DNA probe molecules, which increase the density of DNA binding sites per unit cross-sectional area of substrate.

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6. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pantano et al. (US 2003/0054176) in view of Young et al. (US 6,391,809).

Pantano et al., as applied to claims 1 and 8, teach a borosilicate glass composition, but fail to teach the coefficient of thermal expansion.

Young et al. teach borosilicate glass having a coefficient of thermal expansion of  $30\text{--}40 \times 10^{-7}/^{\circ}\text{C}$ , in particular a borosilicate lamp glass being  $38 \times 10^{-7}/^{\circ}\text{C}$  (col. 1, lines 51-53), in order to provide a fusion-type seal with a low softening temperature while also maintaining a low to medium coefficient of thermal expansion.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to include in the borosilicate glass composition as taught by Pantano et al., a coefficient of thermal expansion of  $38 \times 10^{-7}/^{\circ}\text{C}$  as taught by Young et al., in order to match the coefficients of thermal expansion between a borosilicate non-porous glass substrate and the porous inorganic layer.

### ***Conclusion***

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melanie Yu whose telephone number is (571) 272-2933. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on (571) 272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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Art Unit 1641



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1/24/05